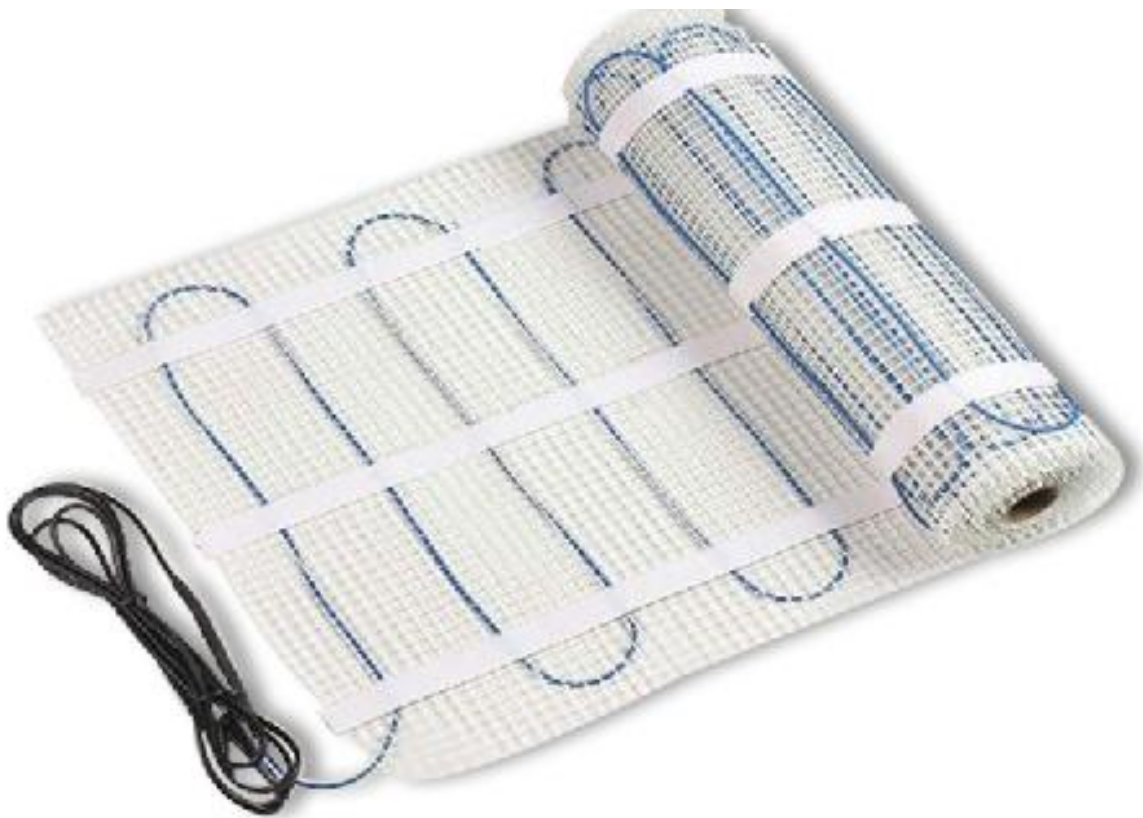

HeatingMat System Installation Manual



Underfloor Heating System

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Important Safeguards and Warnings

WARNING: Shock and fire hazard

If the HeatingMat System is damaged or not installed properly, fire or shock could occur resulting in serious personal injuries or damage to property. You must carefully follow the warnings and instructions contained in this manual.

- The correct power rated thermostat must be used.
- It is important that this equipment is installed only by qualified electricians who are familiar with the proper sizing, installation, construction and operation of floor warming system and the hazards involved. The installation must comply with all national and local electrical codes. If you are unfamiliar with these requirements, contact an electrician.
- The HeatingMat System is designed for under floor heating purposes only. Be sure that the floor is not penetrated by nails, screws, or similar devices that can cause damage on first installation or during subsequent floor repairs in the future.
- If the HeatingMat System is damaged, it must be replaced. Do not attempt to splice or repair any part of the system

1 General Information

1.1 Use of the Manual

This manual describes the HeatingMat floor heating system — how to design the room, select the product, and install the system. It is important to thoroughly review this manual and the following document prior to installation:



FH Thermostat Installation and Operation Manual

For additional information regarding any aspect of the HeatingMat System, contact:

1.2 Safety Guidelines

The safety and reliability of any floor heating system depends on proper design, installation, and testing. Incorrect installation or mishandling of the product can cause damage to the heating cable, system components and property, and can create a risk of fire or shock. The guidelines and instructions contained in this guide are important. Follow them carefully to minimize these risks and to ensure that the HeatingMat system performs reliably.

Pay special attention to the following:


- Instructions marked  Important
- Safety warnings identified as  WARNING

1.3 Remember to measure resistance

The resistance should be measured between the two conductors, brown and blue. Compare this resistance reading to the resistance specified in the Product Selection “Table 1 or Table 2”. The value should be within -5% to +10%.

Also, measure the resistance between the brown, blue and shielding/ground wire. Both should read infinity.

Please refer to “5 Commissioning” for instructions on how to measure the resistance.

 **Important: measure the resistance four times during the installation process** Remember to always measure, verify and record the actual resistance throughout the installation process

(out of the box, after installation, after thin set cement or self-leveler application and after installation of floor tiles).

2 HeatingMat System

2.1 HeatingMatD Specifications

Cable Construction:	Twin conductor
Rated Voltage:	230V
Output:	150W/m ² & 200W/m ²
Cable Diameter:	2mm
Conductor Insulation:	fluoropolymer
Outer Jacket:	fluoropolymer
Max. Ambient Temp.:	85°F (30°C)
Min. Installation Temp.:	40°F (5°C)
Cold lead	3-wire; 3.0m length

2.2 Thermostat Specifications

Functions:	On/Off control, digital display, 7-day programmable
Supply Voltage :	230 V ±15%, 50/60 Hz
Maximum switching current :	16 Amp
Temperature control range :	40 to 104°F (5 to 40°C)
Ambient range :	32 to 104°F (0 to 40°C)
Floor temperature sensor :	2-wire, 3.0m lead wire

2.3 HeatingMat typical installations and applications

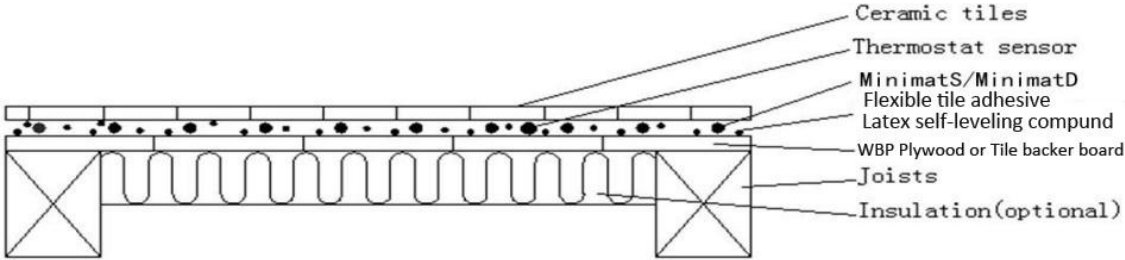


Figure 1: Directly on plywood

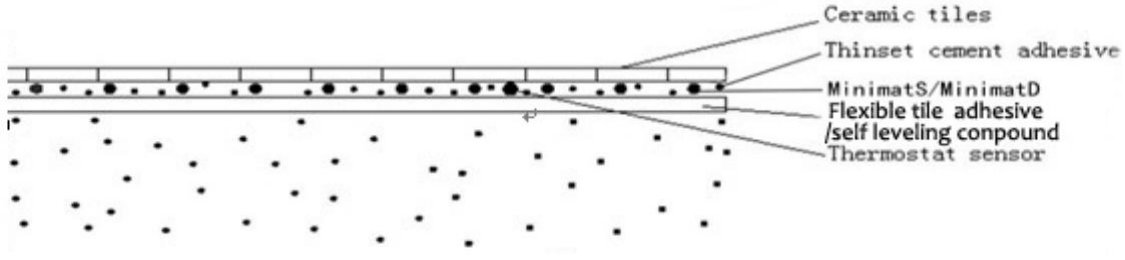


Figure 2: Directly onto Concrete

Alternative method: Latex self-leveling compound is recommended for large surfaces and the following floor materials: engineered wood, laminate, floating floors, vinyl, linoleum and carpet.

 **Warning**

Consult the manufacturer for information on special installation requirements for wood, laminate and vinyl or linoleum flooring.

 **Important**

- Read the instructions carefully before installing HeatingMat system.
- Remember to measure the resistance four times.
- Only for indoor installation. Do not install HeatingMat in walls or ceilings.
- The cable must be embedded in mortar, thinset, Flexible tile adhesive / self leveling compound or similar material.
- The minimum installation temperature is 40°F (5°C).
- **The heating cable cannot be cut to length, crossed over itself, or installed too close.**
- It is recommended to use copper wire only.
- Remember to check that the supply voltage matches the voltage of the HeatingMat.
- Remember to place the labels as written in this instruction.

Please consult the factory for any other questions or advice.

3 Floor Heating Design and Product Selection

3.1 Design the Installation

Step 1: Measure the heated area

Determine the heated area of the floor where there are no permanent fixtures or furniture such as showers, toilets, vanities, or cabinets. Measure the heated area of the floor.

For example, in Figure 3, the area of the bathroom is 8.75 m². When you subtract the area of the vanity, shower and toilet, the total heated area is only 6.45 m².

Step 2: Determine the power supply voltage

Make sure the supply voltage was 230 V.

Step 3: Plan the design

Determine the optimum floor heating mat layout for your heated area to ensure coverage. Select a spot for the thermostat in the wall above the heated area where it can be reached by the 3.0m cold lead on the HeatingMat, and the 3.0m floor temperature sensor. Please refer to Figure 4.

Important

The predetermined HeatingMat spacing must be maintained to ensure proper floor heating. Do not change the HeatingMat heating cable spacing when you lay out the cable or the floor may have cold spots.

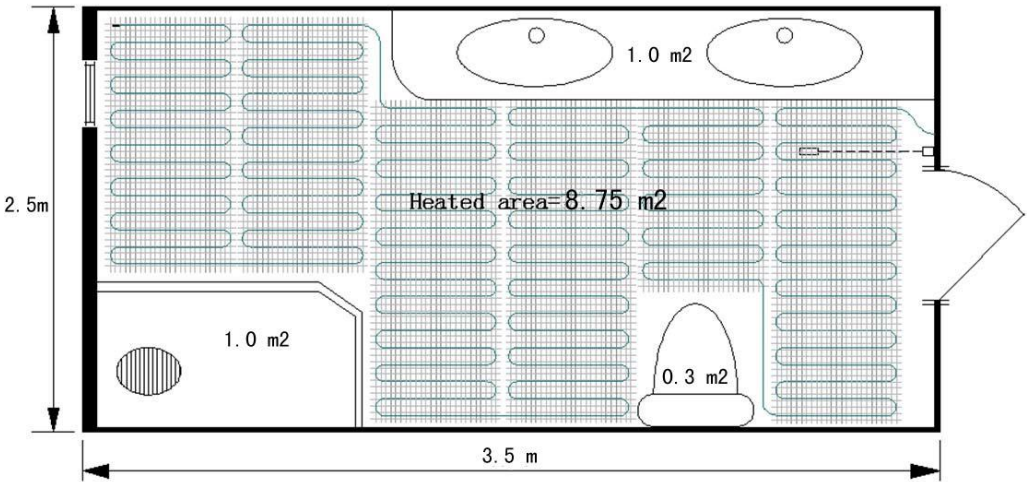


Figure 3: Heated area example

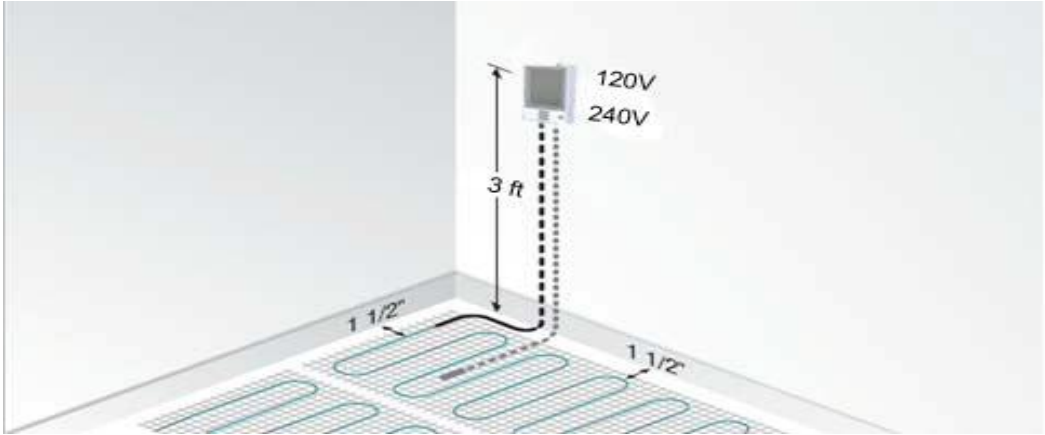


Figure 4: Typical cold lead and floor

3.2 Confirm Your Product Selection

Confirm that your HeatingMat is no larger than the heated area. Following the example from Figure3, if the heated area is 6.45 m², select the 6.0 m² HeatingMat system.



Important

When installing HeatingMat_s, all “cold tails” (brown/blue wires) must be taken back to the connection point/controller.

Table 1: HeatingMat Product Selection

230V	Heated Area		Mat Dimensions		Watts (150W/m ²)	Amps	ohms
Catalog Number	m2	sq.ft.	m*m	in.*ft.			
HeatingMat /150-150-1.0	1.0	10.8	0.5*2	20*6.5	150	0.7	352.7
HeatingMat /150-225-1.5	1.5	16.1	0.5*3	20*9.7	225	1.0	235.1
HeatingMat /150-300-2.0	2.0	21.5	0.5*4	20*12.9	300	1.3	176.3
HeatingMat /150-375-2.5	2.5	26.9	0.5*5	20*16.1	375	1.6	141.1
HeatingMat /150-450-3.0	3.0	32.3	0.5*6	20*19.4	450	2.0	117.6
HeatingMat /150-525-3.5	3.5	37.7	0.5*7	20*22.6	525	2.3	100.8
HeatingMat /150-600-4.0	4.0	43.1	0.5*8	20*25.8	600	2.6	88.2
HeatingMat /150-675-4.5	4.5	48.4	0.5*9	20*29.1	675	2.9	78.4
HeatingMat /150-750-5.0	5.0	53.8	0.5*10	20*32.3	750	3.3	70.5
HeatingMat /150-900-6.0	6.0	64.6	0.5*12	20*38.8	900	3.9	58.8
HeatingMat /150-1050-7.0	7.0	75.3	0.5*14	20*45.2	1050	4.6	50.4
HeatingMat /150-1200-8.0	8.0	86.1	0.5*16	20*51.7	1200	5.2	44.1
HeatingMat /150-1350-9.0	9.0	96.9	0.5*18	20*58.1	1350	5.9	39.2
HeatingMat /150-1500-10	10	107.6	0.5*20	20*64.6	1500	6.5	35.3
HeatingMat /150-1650-11	11	118.4	0.5*22	20*72.2	1650	7.2	32.1
HeatingMat /150-1800-12	12	129.2	0.5*24	20*77.5	1800	7.8	29.4

Table 2 (continue)

230V	Heated Area		Mat Dimensions		Watts (200W/m ²)	Amps	ohms
Catalog Number	m2	sq.ft.	m*m	in.*ft.			
HeatingMat /200-200-1.0	1.0	10.8	0.5*2	20*6.5	200	0.9	264.5
HeatingMat /200-300-1.5	1.5	16.1	0.5*3	20*9.7	300	1.3	176.3
HeatingMat /200-400-2.0	2.0	21.5	0.5*4	20*12.9	400	1.7	132.3
HeatingMat /200-500-2.5	2.5	26.9	0.5*5	20*16.1	500	2.2	105.8
HeatingMat /200-600-3.0	3.0	32.3	0.5*6	20*19.4	600	2.6	88.2
HeatingMat /200-700-3.5	3.5	37.7	0.5*7	20*22.6	700	3.0	75.6
HeatingMat /200-800-4.0	4.0	43.1	0.5*8	20*25.8	800	3.5	66.1
HeatingMat /200-900-4.5	4.5	48.4	0.5*9	20*29.1	900	3.9	58.8
HeatingMat /200-1000-5.0	5.0	53.8	0.5*10	20*32.3	1000	4.3	52.9
HeatingMat /200-1200-6.0	6.0	64.6	0.5*12	20*38.8	1200	5.2	44.1
HeatingMat /200-1400-7.0	7.0	75.3	0.5*14	20*45.2	1400	6.1	37.8
HeatingMat /200-1600-8.0	8.0	86.1	0.5*16	20*51.7	1600	7.0	33.1
HeatingMat /200-1800-9.0	9.0	96.9	0.5*18	20*58.1	1800	7.8	29.4
HeatingMat /200-2000-10	10	107.6	0.5*20	20*64.6	2000	8.7	26.5
HeatingMat /200-2200-11	11	118.4	0.5*22	20*72.2	2200	9.6	24.0
HeatingMat /200-2400-12	12	129.2	0.5*24	20*77.5	2400	10.4	22.0

4 Installation



Important: Tools and materials required

You will require the following items to install and test the floor heating system:

- Scissors
- Utility knife
- Wire strippers
- Tape measure
- Screwdriver
- Multimeter

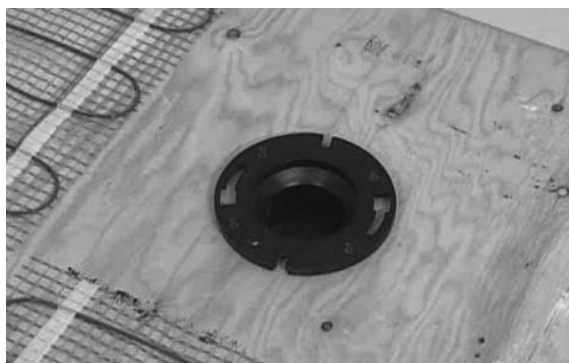
You will also need the appropriate tools and materials to install your particular floor. These will likely include products like Flexible self-leveling compound, thin-set mortar, backer board, tile, a notched trowel, and any other tools for your specific floor.

Follow these steps to ensure a successful HeatingMat installation.

Step 1: PLAN LAYOUT

Make a sketch layout or a floor plan of the room; include all permanent furnishings such

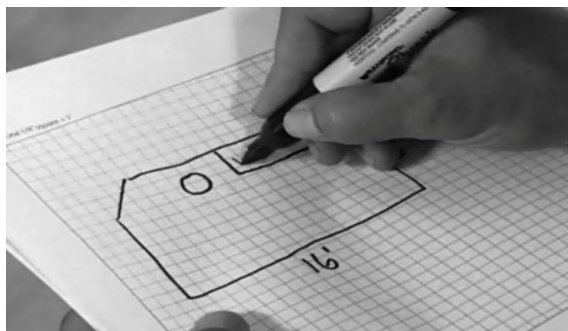
as toilets, bathtubs, appliances, cabinetry, etc. Indicate all dimensions required to determine the available floor area and the position of the FH thermostat.



Important

We recommend that the installation is documented with photos to note the location of connections and the sensor.

Step 2: TRANSFER LAYOUT TO FLOOR Draw an outline of the layout on the room floor including a foot print of all furnishings that are not yet installed. Unroll the first few feet of the HeatingMat. The starting point of the cable must be placed within 2.5m from the thermostat.



Important

Mark the position of the connection point

between the power lead and the HeatingMat heating cable. **This connection must be concealed in thinset or self-leveling cement.** When using a floor temperature sensing thermostat, mark the sensor position in the middle of 2 heating cables, about 25cm away from the wall (within the heated area), as close as possible to the thermostat.

Step 3: INSTALL SENSOR

If using a floor temperature sensing thermostat, install the sensor now, either in conduit tube, or directly to the subfloor. It is recommended that the sensor be installed in conduit tube. This will allow the sensor to be easily replaced in the unlikely event of failure.

The sensor and/or tube needs to be installed between the thermostat wall box and the sensor position. The conduit tube must be partially countersunk into the subfloor. Cut a channel approximately 25mm deep × 25mm wide in the floor and wall up to the thermostat for the sensor conduit. The conduit has to go from the thermostat and minimum of 25cm away from the wall towards the middle of the floor.



Important

The sensor conduit must be centered in the cable loop (between two heating wires).

Use duct tape to close the end of the conduit so that thinset can't penetrate the conduit.

Use duct tape to hold the sensor conduit into the groove to prevent it from floating up when the mortar or thinset is poured.

If the sensor is installed directly in the mortar bed, use duct tape to secure to subfloor.

Step 4: PREPARE SUBFLOOR SURFACE

Clean and vacuum the floor thoroughly and remove dust and debris from the floor that may damage the heating cable.

Ensure that the subfloor is secure and stable. Carefully fill in all cracks to prevent any potential damage to the new tiles resulting from shifts in the subfloor. If required prime the subfloor with a suitable primer to prepare the surface ready for the tile adhesive.

Step 5: MEASURE THE RESISTANCE (THE FIRST TIME)

Use a digital ohm meter to measure the resistance of the HeatingMat and compare it to Table 2. Record the measured resistance on the warranty card. **Documenting the resistance at each stage of installation is required for warranty purposes.** Also, measure the resistance between the brown, blue and shielding/ground wire. Both should read infinity.

Please refer to “5 Commissioning” for instructions on how to measure the resistance.

Step 6: BEGIN LAYING THE HeatingMat

An adhesive has been added to the bottom of the mat which will prevent the mat from moving during installation. Start by placing the mat such that the connection point and the temperature sensor are in their intended

positions and bring the power cable to the thermostat or connection box.

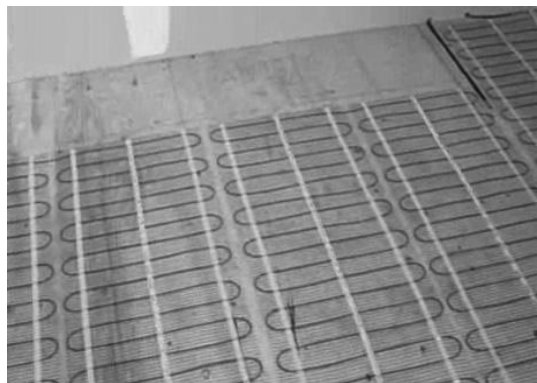
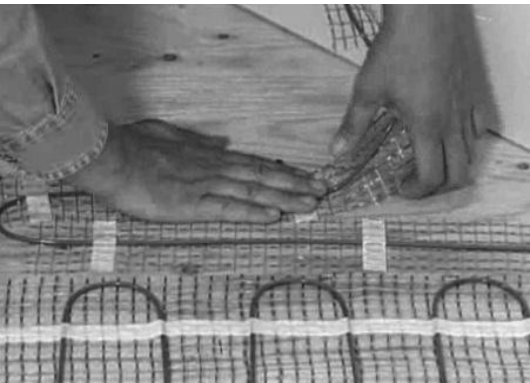
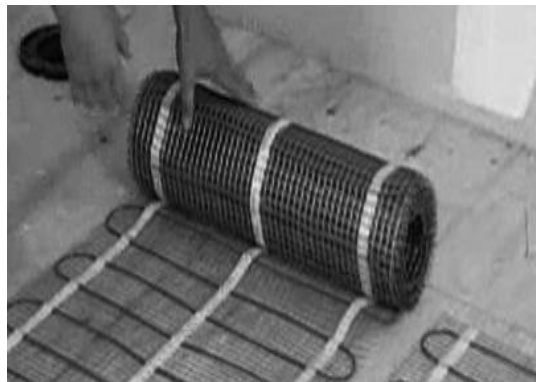
Begin unrolling the HeatingMat evenly across the floor outside the areas that you marked previously. The adhesive on the mat is made such that the mat may be moved several times before it loses its adhesiveness. When you reach the next wall, cut the mesh, turn the mat, and begin rolling in the desired direction.

NEVER CUT OR SHORTEN THE HEATING CABLE!

Ensure that the HeatingMat is in full contact with the subfloor at all times. Avoid walking on the heating mat. If this is not possible, **use shoes with soft soles.**

When approaching obstacles (toilets, cabinets, etc.), carefully remove some of the heating cable from the mat and lead the cable around the obstacle. In some cases pieces of the mesh will be cut away entirely.

Remember to never cut the cable. Use hot melt glue or a thin strip of tape to secure the loose cable to the floor. **It is highly recommend to take photographs of the installed HeatingMat before installing the flooring.**



Step 7: MEASURE THE RESISTANCE (THE SECOND TIME)

Please refer to Step 5.

Step 8: INSTALL FLOOR COVERING

ENSURE THAT THE SENSOR CONDUIT HAS BEEN PROPERLY INSTALLED BEFORE PROCEEDING (see Step 3).

In the case of tiles, proceed with the installation of the tiles by covering the heating cables with a layer of thin-set cement as directed by the tile manufacturer. Ensure that the thin-set mortar covers the entire height of the heating cable as the tiles are installed. In the case of a wood, engineered or laminate floor covering, it is recommended that the flooring manufacturer be contacted. For wooden floors, a minimum of 10mm of self-leveling cement over the heating cable is recommended. Ensure that all moisture in the self-leveling cement has been fully eliminated in accordance with the drying times recommended by the manufacturer (consult the manufacturer for exact drying time).



Important

The system must not be turned on until the thinset cement has fully dried. A minimum of two weeks is recommended.

Step 9: MEASURE THE RESISTANCE (THE THIRD TIME)

Please refer to Step 5.

Step 10: Install the tile

To install the tile, apply a layer of acrylic or latex modified thin-set using the ridged side of your trowel. Tile and grout the floor using best industry practices and in accordance with instructions provided by the manufacturer of the tile.

Step 11: CONNECT POWER SUPPLY AND THERMOSTAT

The connection of the power supply and the FH thermostat must be done by a qualified electrician. The electrician should connect the floor sensor to the thermostat, take the final resistance reading and record it on the warranty card, see Step 13.

Note: You need to mark the appropriate circuit breaker reference label indicating which branch circuit supplies the circuits to those electric space heating cables.

Step 12: MEASURE THE RESISTANCE (THE FOURTH TIME)

Please refer to Step 5.

Step 13: RECORD INFORMATION AND AFFIX LABELS

It is important for the homeowner to mail in the certificate immediately after installing the system (cable and thermostat). Failure to do so could void the manufacturer's warranty. The warranty is subject to the guarantee conditions listed on the warranty certificate.

Keep a copy of the warranty card for your reference.

Step 14: ENJOY THE COMFORT OF HeatingMat

The HeatingMat heating system is now ready to use. Increase the floor temperature gradually and adjust it until it reaches a comfortable level depending on the type of room and your personal preferences.

5 Commissioning

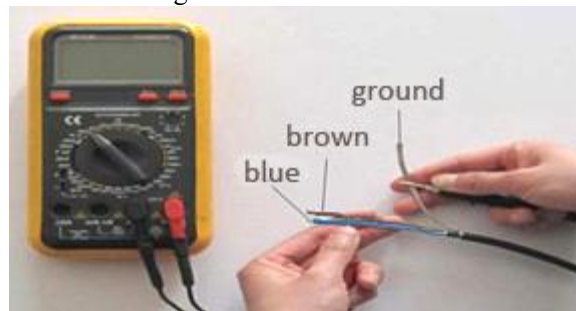
Important

You must perform the Insulation Resistance Test, the Heating Cable Resistance Test, and the Sensor Resistance Test four times (Please refer to 4 installation) during the installation process.

5.1 Insulation Resistance Test

This test ensures that the insulating jackets of the mat are not damaged. A low value indicates the cable has been damaged and must be replaced.

1. Connect the ground wire to the black lead and both power wires to the red lead of the multimeter.
2. Make sure the meter reads “Open” or “OL.”
3. Record these readings on the warranty card.



5.2 Heating Cable Resistance Test

This test measures the resistance of the heating mat and is used to determine circuit integrity.

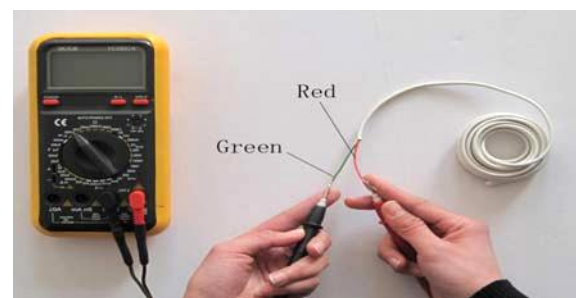
1. Set your multimeter to the 200 or 2000 ohm range.
2. Connect the multimeter leads to the black and white cold lead wires.
3. Compare this resistance reading to the resistance specified in the Product Selection “Table 1 or Table 2”. The value should be within -5% to +10%.
4. Record these readings on the warranty card.



5.3 Sensor Resistance Test

This test measures the resistance of the floor sensor and is used to verify the sensor integrity.

1. Set your multimeter to the 200K ohm range.
2. Connect the multimeter leads to the red and green lead wires.
3. Make sure the meter resistance reads between the probe resistance value stated in the thermostat instructions.
4. Record these readings on the warranty card.



6 Troubleshooting

Symptom	Probable Causes	Corrective Action
Floor doesn't heat	<p>No voltage.</p> <p>Circuit breaker tripped.</p> <p>Ground-fault tripped in the thermostat.</p> <p>Thermostat not turned on.</p> <p>Cable not connected to thermostat.</p> <p>Floor temperature sensor not connected.</p> <p>Faulty sensor.</p>	<p>Check circuit breaker.</p> <p>Ensure that there are not too many mats or other appliances connected on the same circuit. The HeatingMat may require a dedicated circuit. See the Product Selection "Table 1 or Table 2" of this manual.</p> <p>Refer to Thermostat Installation and Operation Manual.</p> <p>Refer to Section 4 of this manual, and the Thermostat Installation and Operation Manual.</p> <p>Refer to Thermostat Installation and Operation Manual.</p> <p>Refer to Thermostat Installation and Operation Manual.</p>
Floor warm all the time	Clock not set correctly.	Refer to Thermostat Installation and Operation Manual.
Floor not warm enough	Thermostat setting not set correctly.	Refer to Thermostat Installation and Operation Manual.
Installation instructions not available		Download the latest version of HeatingMat system Installation Instructions

7 Installation Plan Layout

To ensure the validity of your guarantee and the compliance to the 17th Edition wiring (BS7671:2008) please provide a plan layout of your underfloor heating installation. This sketch should be left next to the distribution board of the heating system together with thermostat user instructions,

Part 1 - To be completed by the cable mat installer

What is the product code(s) of the heating mat installed? -----

What are the room dimensions? -----

What is the heated area? -----

Have you marked the position of the junction box on the sketch? -----

Have you marked the position of the thermostat box on the sketch? -----

Have you marked the position of the floor probe on the sketch? -----

Have you marked the position of the cable turns? -----

Part 2 - To be completed by the Electrician

What is the measured resistance of the installed heating mats (Ohms)?

Mat 1 ----- Mat 2 ----- Mat 3-----

What is the total measured resistance of the mats connected in parallel (Ohms)?-----

What is the RCD rating (ma)? ----- (30Ma)

What is the rated voltage (V)? -----

What is the total power of the installation (W)? -----

What is the insulation resistance (ohms)? -----

What was the test voltage used (V)? ----- (30mA 230V)

